SWITCHED VOLTAGE-MODE DITHER SIGNAL GENERATION FOR A SIGMA-DELTA MODULATOR

ABSTRACT OF THE DISCLOSURE

A sigma-delta modulator (10) has an input node coupled to a first input of a loop filter (12); a quantizer (14) that has an input coupled to an output of the loop filter for receiving a differential input signal therefrom and a feedback path (18) coupled from an output of the quantizer to a second input of the loop filter. The quantizer input includes a first input signal transistor (14A) and a second input signal transistor (14B) having gates coupled to the differential input signal, a first set of transistors (M1a,...,Mna) connected in parallel with the first input signal transistor (M0a), and a second set of transistors (M1b,...,Mnb) connected in parallel with the second input signal transistor (M0b). A gate of each transistor of the first set of transistors is switchably coupled by a digital signal to either the input signal or to ground, and a gate of each transistor of the second set of dither transistors is switchably coupled by an inverted version of the digital signal to either the input signal or to ground. The digital signal is generated to have random or pseudo-random characteristics, such as by using a LFSR (20). The result is the creation of an imbalance in the quantizer input transistor structure that results in the generation of a noise signal that functions as a dither signal.